UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, Washington 98115

Refer to NMFS Tracking No. 2009/05746

September 1, 2010

Michelle Walker
Seattle District
Army Corps of Engineers
PO Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the SR 162 Puyallup River Bridge Replacement (NWS-2009-211), (HUC 171100140403 Puyallup River-Kapowsin Creek), Pierce County, Washington

Dear Mr. Mathis:

The enclosed document contains a Biological Opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the project referenced above. In this Opinion, the NMFS concludes that the proposed action is not likely to jeopardize the continued existence of Puget Sound (PS) Chinook salmon and PS steelhead.

As required by section 7 of the ESA, the NMFS provides an incidental take statement with the Opinion. The incidental take statement describes a reasonable and prudent measure that is necessary to minimize incidental take. The take statement sets forth nondiscretionary terms and conditions. Incidental take from actions that meet these terms and conditions will be exempt from the ESA take prohibition.

NMFS has concluded that the project will have no adverse effect on EFH. Therefore, NMFS did not make any conservation recommendations pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (section 305(b)(4)(A)). Since NMFS is not providing conservation recommendations, no 30-day response from the FHWA is required (MSA section 305(b)(4)(B)).

If you have questions regarding this consultation, please contact Scott E. Anderson of the Washington State Habitat Office at (206) 526-4645, or by electronic mail at Scott.Anderson@noaa.gov.

Sincerely,

William W. Stelle, Jr.
Regional Administrator

Enclosure

cc: Carl Ward, WSDOT
Sandra Manning, COE

Endangered Species Act
Biological Opinion

And

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

SR 162 Puyallup River Bridge Replacement,
Puyallup River, 6th Field HUC 171100140403 Puyallup River-Kapowsin Creek,
Pierce County, Washington

Lead Action Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	National Marine Fisheries Service Northwest Region
Date Issued:	September 1, 2010
Issued by:	William W. Stelle Jr Regional Administrator
NMFS No.:	**2009/05746**

LIST OF ABBREVIATIONS AND ACRONYMS

BA - Biological Assessment
BMP - Best Management Practice
BRT – Biological Review Team
CH – Critical Habitat
CHART - Critical Habitat Analysis Review Team
CMZ - Channel Migration Zone
COE - U.S. Army Corps of Engineers
DPS - Distinct Population Segment
DQA – Data Quality Act
EFH – Essential Fish Habitat
ESA - Endangered Species Act
ESU - Evolutionarily Significant Unit
HUC - Fifth Field Hydrologic Unit
ITS – Incidental Take Statement
LWD - Large Woody Debris
NMFS – National Marine Fisheries Service
NTU - Nephelometric Turbidity Unit
Opinion – Biological Opinion
OHWM - Ordinary High-Water Mark
PFMC - Pacific Fishery Management Council
PCE - Primary Constituent Element
PS – Puget Sound
RPM - Reasonable and Prudent Measure
RM - River Mile
SPCC - Spill Prevention Control and Countermeasures
TDAs - Threshold Discharge Areas
VSP - Viable Salmonid Population
WDFW - Washington State Department of Fish and Wildlife
WSDOT - Washington State Department of Transportation

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INTRODUCTION

This document contains a biological opinion (Opinion) that was prepared by National Marine Fisheries Service (NMFS) in accordance with section 7(b) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531, et seq.), and implementing regulations at 50 C.F.R. 402.[1] It also contains essential fish habitat (EFH) conservation recommendations prepared by NMFS in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801, et seq.) and implementing regulations at 50 C.F.R. 600. The Opinion and EFH conservation recommendations are both in compliance with Section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act) (44 U.S.C. 3504 (d)(1) and 3516), and underwent pre-dissemination review. The administrative record for this consultation is on file at the Lacey, Washington office.

Background and Consultation History

On October 21, 2009, NMFS received a letter from the United States Army Corps of Engineers (COE) requesting formal consultation pursuant to section 7(a)(2) of the ESA, and EFH consultation pursuant to section 305(b)(2) of the MSA for the Washington State Department of Transportation's (WSDOT) Puyallup River bridge replacement in Pierce County, Washington. The project requires a COE section 404 and section 10 permit, creating the Federal nexus. Additional information was received May 10, 2010. Formal consultation was initiated on May 10, 2010. The consultation also included numerous telephone conversations and electronic mail between NMFS and WSDOT staff. In the BA, the COE determined the proposed action was likely to adversely affect Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*), and PS steelhead (*O. mykiss*). The COE also determined the proposed action was likely to adversely affect PS Chinook critical habitat, and will have an adverse affect on Essential Fish Habitat (EFH) for PS Chinook salmon, coho salmon (*O. kisutch*), and pink salmon (*O.gorbuscha*).

Description of the Proposed Action

The COE proposes to permit the Washington State Department of Transportation's (WSDOT) demolition of the existing Puyallup River Bridge at SR 162 (Figure 1), and construction of a new bridge adjacent to the bridge to be removed. Construction is scheduled over a 13-month period with all work below the OHWL of the Puyallup River to be completed during two approved in-water work windows (July 15 to August 31). Specific elements affecting listed species are described below:

New Bridge Construction

The proposed concrete bridge will be a two-span bridge approximately 270-feet long and 40-feet wide. The new bridge will have two, 11-foot lanes with a 9-foot shoulder on both sides. The new bridge will be supported by a total of three drilled shafts. One at each abutment and one

[1] With respect to designated critical habitat, the following analysis relied only on the statutory provisions of the ESA, and not on the regulatory definition of "destruction or adverse modification" at 50 CFR 402.02.

drilled shaft on the north side of the Puyallup River, slightly above the OHWL. There will be no piers below the OHWL. Pre-stressed girders will be precast, brought to the project site, and installed. Before any concrete casting takes place, false work and forms will be built. Once the concrete has cured the false work and forms will be removed. The footings, walls, deck, and barriers will be cast in place at the project site. No concrete will be allowed to enter the stream or adjacent wetlands. Mixer truck wash will be contained, cured, and disposed at an approved and permitted site. Rip rap will be installed on the south abutment and will extend approximately 10 feet both up and downstream from the 40-foot wide bridge, covering a total of 60 lineal feet of riverbank.

Existing Bridge Demolition/Stream Diversion

Removal of the existing concrete bridge will require the structure to be crushed on site. To minimize the potential of debris entering the Puyallup River, an aquabarrier stream diversion structure will be placed from the upstream (north side) left bank out into the river to divert the majority of the flow into a much narrow path on the right bank through the project area. Once the flow is diverted, a temporary containment system and a series of temporary supports will be installed (all below the OHWL). Upon completion of flow diversion, containment and support structure installation, demolition of the bridge will be completed in the dry. Demolition of the existing bridge will require the removal of bridge piers. The bridge pier on the right bank includes large concrete rubble pieces that have been placed as protection from shear forces of the water. Currently, this rubble may provide cover and some limited pool habitat for juvenile salmonids. Removal of this rubble and the associated bridge pier will cause temporary disturbance within the diversion channel and may create a temporary fish passage barrier as a result of noise and general disturbance. Further, small numbers of juvenile PS Chinook salmon or steelhead could be using the rubble area as habitat during removal. In this case, they would be displaced and possibly crushed by concrete rubble movement.

Construction of the temporary shoring and demolition containment structure will require the placement of large temporary spread footings covering 285 square feet (SF) of the exposed gravel bar to support the containment structure. Chain link material and geotech fabric will be placed on the gravel bar to minimize disturbance to the substrate. Once the bridge is supported from underneath with the use of large jacks, the concrete trusses will be demolished from the bridge deck. Once the trusses are demolished, the bridge will be cut into pieces and lowered with the jacks onto the left bank gravel bar and the demolition containment structure. The majority of the remaining portion of the bridge will be demolished on the protected gravel bar of the left bank, behind the aquabarrier. Piers and abutments will be removed to 13 feet below existing grade of the river to avoid the potential for exposure resulting from future scour. The other remaining portion of the bridge will be crushed on the demolition containment structure. Several old creosote piles are exposed within the project footprint, and will be removed during construction. In order to fill in voids created during removal of creosote treated piles and the existing bridge piers, approximately 136 cubic yards of permanent fill will be placed below the OHWL over an area of about 645 square feet.

Fish Capture

Although the aquabarrier will allow for gradual dewatering and therefore will support volitional fish removal, it is expected that dewatering of the roughly 1000 square foot area behind the aquabarrier may necessitate manual fish removal. A project biologist will be on site during dewatering to relocate any stranded fish. In the event that more intensive fish handling is required such as seining or electrofishing, the WSDOT fish handling protocol (WSDOT 2009) will be adhered to.

Minimization Measures

1. Salmonid impacts will be minimized by obtaining a WDFW HPA and implementing all provisions including an in-water work window, which is expected to be July 15 to August 31.
2. Volitional fish relocation will occur. If more intense fish relocation efforts are required, the WSDOT Fish Handling Protocol will be adhered to.
3. Biodegradable hydraulic fluids and lubricants will be used for equipment working below the OHWL within the Puyallup River.
4. In-water construction will take place when the stream flows within the dewatered area are low, possibly dry and listed fish are less likely to be present.
5. All instream depressions remaining on the gravel bar after removal of the temporary containment structure footings will be regraded to prevent fish entrapment.
6. No piers will be placed below the OHWL.
7. If there is a change in species status, or are any changes to the project that may impact listed species, consultation will be reinitiated.
8. Disturbance of the streambed and banks shall be limited to that necessary to dismantle the existing bridge and install the new bridge.
9. Approach material shall be structurally stable and composed of material that, if eroded into the stream, shall not be detrimental to fish life.
10. Standard erosion control and spill control BMPs will be fully implemented.
11. There will be no staging areas within wetlands.
12. Vegetated areas that are impacted during construction will be re-vegetated after construction is completed.

Scope of the Consultation

Certain elements of the proposed action are not likely to adversely affect listed species for reasons described below. These include stormwater, clearing, and grubbing. In addition, the proposed action will not adversely affect adult life histories of the listed species considered in

this consultation for the reasons described below. As such none of these are considered further in this Opinion.

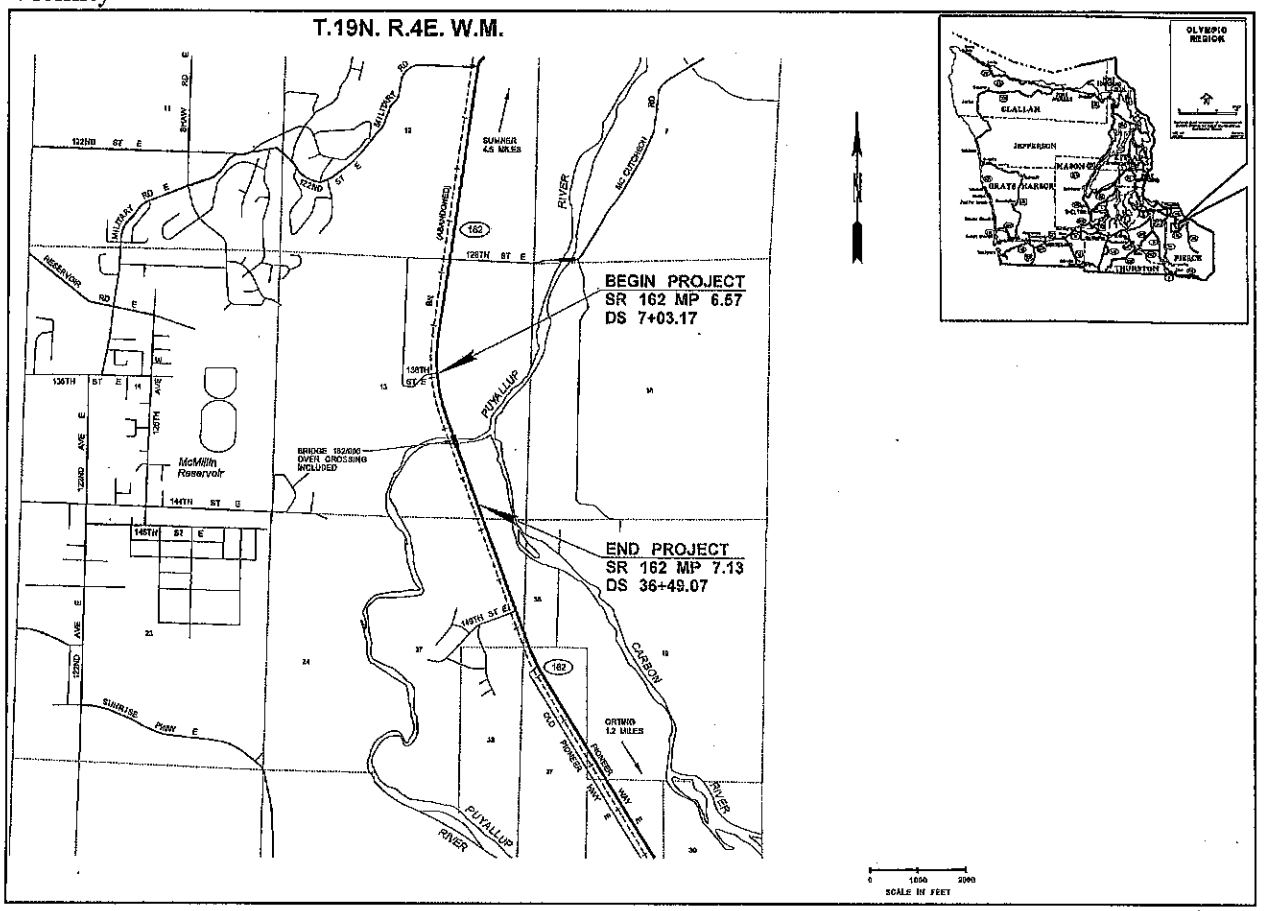
The final stormwater drainage plan for the proposal reduces impervious surface in the project area by approximately 0.39 acres. Proposed stormwater Best Management Practices (BMPs) will treat and infiltrate all stormwater runoff from new and existing impervious surface in the project. There will be no stormwater outfalls into the Puyallup River. Therefore, effects from stormwater are considered discountable to all species and habitat within the action area, and will not be discussed further in this Opinion.

Project activities will include 4.45 acres of clearing and grubbing. Random ornamental trees along the decommissioned alignment will be cleared and grubbed throughout the project limits. Various shrub and herbaceous species within the project area consisting of salmonberry, Himalayan blackberry, sword fern and giant horsetail will also be removed. The riparian habitat of the Puyallup River is minimal and consists of dense shrub vegetation with scattered mature trees, including conifers and large cottonwood. Very few trees that will be removed are functioning as riparian habitat for the Puyallup River. Removal of trees within the riparian corridor of the Puyallup River will be limited to what is necessary to realign SR 162. Following bridge construction and demolition, all cleared and grubbed areas will be mulched and replanted with native vegetation. Because clearing and grubbing will take place outside of the wetted perimeter of the river and will have no measurable effect on existing habitat conditions in the action area, clearing and grubbing is considered insignificant and will not be discussed further in this Opinion.

Migrating adult fall-run PS Chinook salmon are expected to be in the Puyallup River and potentially in the action area during construction. Any adult PS Chinook salmon in the vicinity of the project will have the ability to pass through the project or otherwise avoid any potential affects related to work area isolation, fish handling, and turbidity. Therefore, effects on PS Chinook salmon from the project are considered insignificant and will not be discussed further in this Opinion.

Although the Puyallup River does not support a run of summer steelhead, adult steelhead are caught annually during August and September in the lower Puyallup River. These fish are presumed to be summer-run strays from the Green or Skagit Rivers. Any adult PS steelhead in the vicinity of the project will have the ability to pass through the project or otherwise avoid any potential affects related to work area isolation, fish handling, and turbidity. Therefore, effects on PS steelhead from the project are considered insignificant and will not be discussed further in this Opinion.

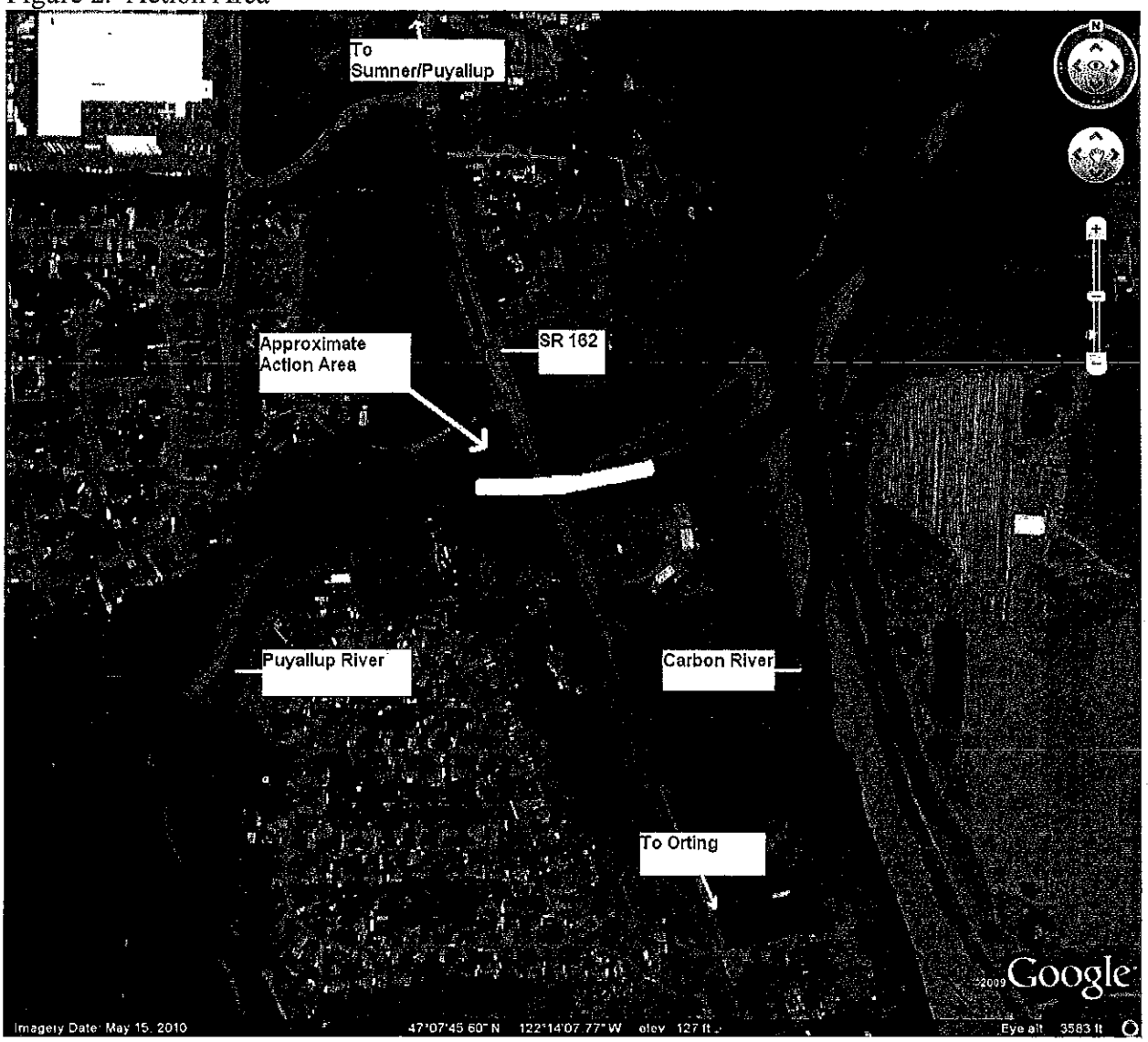
Figure 1. Project Vicinity



Action Area

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For purposes of this consultation, the action area is from the construction site at River Mile (RM) 18.1 of the Puyallup River downstream approximately 300 feet to where effects from turbidity and sedimentation will occur, and upstream approximately 100 feet to where effects from noise and general disturbance may occur (Figure 2). The action area includes spawning, migration, and rearing habitat for both PS Chinook salmon and PS Steelhead, as well as EFH for Chinook salmon, coho salmon, and pink salmon.

Figure 2. Action Area



ENDANGERED SPECIES ACT—BIOLOGICAL OPINION

Section 7(a)(2) of the ESA requires Federal agencies to consult with NMFS to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The Opinion that follows records the results of the interagency consultation for this proposed action. The ITS provided after the Opinion that specifies the impact of any taking of threatened or endangered species that will be incidental to the proposed action, reasonable and prudent measures that NMFS considers necessary and appropriate to minimize such impact, and nondiscretionary terms and conditions (including, but not limited to, reporting requirements) that must be complied with by the Federal agency, applicant (if any), or both, to carry out the reasonable and prudent measures.

To complete the jeopardy analysis presented in this Opinion, NMFS reviewed the status of each listed species of Pacific salmon and steelhead[2] considered in this consultation, the environmental baseline in the action area, the effects of the action, and cumulative effects (50 CFR 402.14(g)). From this analysis, NMFS determined whether effects of the action were likely, in view of existing risks, to appreciably reduce the likelihood of both the survival and recovery of the affected listed species.

For the critical habitat adverse modification analysis, NMFS considered the status of the entire designated area of the critical habitat considered in this consultation, the environmental baseline in the action area, the likely effects of the action on the function and conservation role of the affected critical habitat, and cumulative effects. NMFS used this assessment to determine whether, with implementation of the proposed action, critical habitat would remain functional, or retain the current ability for the primary constituent elements (PCEs) to become functionally established, to serve the intended conservation role for the species.[3]

Status of the Species

This section presents information about the status and trend of species, as they are listed, using attributes associated with a "viable salmonid population" (VSP) (McElhany *et al.* 2000), including information about their geographic distribution, population structure, risks of extinction, and the factors limiting their recovery. Those attributes are influenced by the survival, behavior, and experiences of individual fish throughout the entire life cycle, characteristics that are influenced, in turn, by habitat and other environmental conditions.

One factor affecting the status of salmon and aquatic habitat at large is climate change. On water quality and quantity, climate change could cause altered water yield, peak flows, and stream temperature. Other effects, such as increased vulnerability to catastrophic wildfires, may occur as climate change alters the structure and distribution of forest and aquatic systems. Based on the best available science, there is increasing certainty that climate change is occurring and is accelerating (IPCC 2007; Battin et al. 2007).

In Washington State, most models project warmer air temperatures, increases in winter precipitation, and decreases in summer precipitation. According to model predictions, average temperatures in Washington State are likely to increase between 1.7 degrees and 2.9 degrees C (3.1 degrees and 5.3 degrees F) by 2040 (Casola et al. 2005). Warmer air temperatures will lead to more precipitation falling as rain rather than snow. There is concern, as the snow pack diminishes, and seasonal hydrology shifts to more frequent early large storms, stream flow timing will change and peak river flows will likely increase.

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[2] An "evolutionarily significant unit" (ESU) of Pacific salmon (Waples 1991) and a "distinct population segment" (DPS) (Policy Regarding the Recognition of District Vertebrate Population; 61 FR 4721, Feb 7, 1996) are both "species" as defined in Section 3 of the ESA.

[3] Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (November 7, 2005) (Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act).

In a study to project impacts of climate change on salmon habitat restoration in the Snohomish Basin, model results indicate a large negative impact of climate change on freshwater salmon habitat. The largest driver of climate-induced decline in salmon populations is projected to be the impact of increased winter peak flows which scour the streambed and destroy salmon eggs (Battin et al. 2007). Higher water temperatures and lower spawning flows, together with increased magnitude of winter peak flows are all likely to increase salmon mortality in the Snohomish Basin and in hydrologically similar watersheds throughout the region. This is expected to make recovery targets for these salmon populations more difficult to achieve. Recommendations to mitigate the adverse impacts of climate change include restoring connections to historical floodplains and freshwater and estuarine habitats (ISAB 2007, Battin et al. 2007).

The apparent dependence of stream-type Chinook salmon on snowmelt-dominated patterns of instream flow makes it hard to predict whether efforts to conserve and expand the stream-type life history in Puget Sound Chinook salmon will be hindered by climate change and the potential loss of snowmelt-dominated habitats. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote et al., 2003) – changes that will shrink the extent of the snowmelt-dominated habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories, as the stream-type life history appears to be dependent on a diminishing habitat (Beechie, et al 2006).

Higher ambient air temperatures will likely cause water temperatures to rise (ISAB 2007). Salmon and steelhead require cold water for spawning and incubation. Suitable spawning habitat is often found in accessible higher elevation tributaries and headwaters of rivers. In addition, as climate change progresses and stream temperatures warm, thermal refugia will be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold water refugia.

Puget Sound Chinook Salmon

Factors for the decline of PS Chinook salmon include a variety of human activities that have degraded extensive areas of PS Chinook salmon spawning and rearing habitat. Development has limited fish access to historical spawning grounds and altered downstream flow and thermal conditions. Urbanization affects many parts of the aquatic environment. It has caused direct loss of riparian vegetation and soils, significantly altered hydrologic and erosion rates and processes by creating impermeable surfaces (roads, buildings, parking lots, sidewalks etc.), and polluting waterways. Urbanization throughout the Puget Sound region has increased sedimentation, raised water temperatures, and decreased large woody debris recruitment. In addition, this urbanization has also decreased gravel recruitment, reduced river pools and spawning areas, and dredged and filled estuarine rearing areas (Bishop and Morgan 1996). Large areas of lower river meanders (formerly mixing zones between fresh and salt water) have been channelized and diked for flood

control and to protect agricultural, industrial and residential development. In spite of this, habitat degradation in upstream areas has exacerbated flood events in these areas with adverse effects on Chinook salmon populations (NMFS 1998). The BRT found moderately high risks for all VSP categories (Good et al. 2005) for PS Chinook salmon.

Diversity and Spatial Structure. The PS Chinook salmon ESU includes all naturally-spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington (64 FR 14208, March 24, 1999). The PS Chinook salmon ESU is composed of 31 historically quasi-independent populations, 22 of which are believed to be extant (PSTRT 2001). The nine populations presumed extinct are mostly early- run fish; most of these are in mid- to southern Puget Sound or Hood Canal and the Strait of Juan de Fuca. Up to twenty-six artificial propagation programs are part of the ESU. Eight of the programs are directed at conservation, and are specifically implemented to preserve and increase the abundance of native populations in their natal watersheds where habitat needed to sustain the populations naturally at viable levels has been lost or degraded. The remaining programs are operated primarily for fisheries harvest augmentation purposes (some of which also function as research programs) using transplanted within-ESU-origin Chinook salmon as broodstock.

These artificially-propagated stocks are no more divergent relative to the local natural population(s) than what would be expected between closely related natural populations within the ESU (NMFS 2005). Assessing extinction risk for the PS Chinook salmon ESU is complicated by high levels of hatchery production and a limited availability of information on the fraction of natural spawners that are of hatchery-origin.

Abundance and Productivity. Most populations have a recent five-year mean abundance of fewer than 1,500 natural spawners. Currently observed abundances of natural spawners in the ESU are several orders of magnitude lower than estimated historical spawner capacity, and well below peak historical abundance (approximately 690,000 spawners in the early 1900s) (NMFS 2005). Recent five-year and long-term productivity trends remain below replacement for the majority of the 22 extant populations of PS Chinook salmon. The Biological Review Team (BRT) was concerned about the concentration of the majority of natural production in just a few subbasins, the disproportionate loss of early run populations, and the pervasive use of Green River stock and stocks subsequently derived from the Green River stock. Together these factors may reduce the genetic diversity and fitness throughout the ESU.

In terms of productivity, the hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (NMFS 2004). Long-term trends in abundance for naturally spawning populations of Chinook salmon in Puget Sound indicate that approximately half the populations are declining, and half are increasing in abundance over the length of available time series. The median, over all populations, of long-term trend in abundance is 1.0 (range 0.92–1.2), indicating that most populations are just replacing themselves.

Puget Sound Steelhead

Puget Sound steelhead was listed as threatened on May 11, 2007 (72 FR 26722). The principal factor for decline for PS steelhead is the present or threatened destruction, modification, or curtailment of its habitat or range. Barriers to fish passage and adverse effects on water quality and quantity resulting from dams, the loss of wetland and riparian habitats, and agricultural and urban development activities have contributed and continue to contribute to the loss and degradation of steelhead habitats in Puget Sound. Existing regulatory mechanisms inadequately protect habitats as evidenced by the historical and continued threat posed by the loss and degradation of nearshore, estuarine, and lowland habitats due to agricultural activities and urbanization. Ocean and climate conditions can have profound impacts on the continued existence of steelhead populations. (72 FR 26722, May 11, 2007)

Spatial Structure and Diversity. The DPS includes all naturally spawned anadromous winter-run and summer-run steelhead populations, in streams in the river basins of Puget Sound, as well as the Green River natural and Hamma Hamma winter-run steelhead hatchery stocks. The majority of hatchery stocks are not considered part of this DPS because they are more than moderately diverged from the local native populations (NMFS 2005). Resident steelhead occur within the range of PS steelhead but are not part of the DPS due to marked differences in physical, physiological, ecological, and behavioral characteristics (71 FR 15666; March 29, 2006). The PS steelhead DPS includes more than 50 stocks of summer- and winter-run fish.

Abundance and Productivity. No estimates of historical (pre-1960s) abundance specific to the PS steelhead DPS are available. Of the 21 independent stocks for which adequate escapement information exists, 17 stocks have been declining and four increasing over the available data series, with a range from 18 percent annual decline (Lake Washington winter steelhead) to seven percent annual increase (Skykomish River winter steelhead). Eleven of these trends (nine negative, two positive) were significantly different from zero. The two basins producing the largest numbers of steelhead (Skagit and Snohomish Rivers) both have overall upward trends. Hatchery fish in this DPS are widespread, spawn naturally throughout the region, and are largely derived from a single stock (Chambers Creek). The proportion of spawning escapement comprised of hatchery fish ranged from less than one percent (Nisqually River) to 51 percent (Morse Creek). In general, hatchery proportions are higher in Hood Canal and the Strait of Juan de Fuca than in Puget Sound proper. Most of the hatchery fish in this region originated from stocks indigenous to the DPS, but are generally not native to local river basins. Summer steelhead stocks within this DPS are all small, occupy limited habitat, and most are subject to introgression by hatchery fish.

Specifically, the BRT concluded that there is: (1) a high risk to the viability of PS steelhead due to declining productivity and abundance; (2) a moderate risk due to reduced spatial complexity of, and connectivity among, populations; and (3) a moderate risk due to the reduced life-history diversity of populations and the potential threats posed by artificial propagation and harvest practices in Puget Sound.

Status of Critical Habitat

The NMFS has not yet designated critical habitat for Puget Sound steelhead. NMFS designated critical habitat for the PS Chinook ESU on September 2, 2005. The Primary Constituent Elements (PCEs) for PS Chinook salmon critical habitat are the sites and the physical characteristics' of such sites, which are essential to support one or more life stages of the ESU. The PCEs of PS Chinook salmon critical habitat are:

> PCE 1 - Freshwater spawning sites with water quantity and quality conditions and substrate that support spawning, incubation, and larval development;
>
> PCE 2 - Freshwater rearing sites with (1) water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility, (2) water quality and forage that support juvenile development, and (3) natural cover such as shade, submerged and overhanging large wood, logjams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
>
> PCE 3 - Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks that support juvenile and adult mobility and survival;
>
> PCE 4 - Estuarine areas free of obstruction and excessive predation with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation;
>
> PCE 5 - Nearshore marine areas free of obstruction and excessive predation with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and
>
> PCE 6 - Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The Critical Habitat Analysis Review Team (CHART) evaluated the existing habitat conditions and determined a conservation priority for all critical habitat PCEs within each Fifth Field Hydrologic Unit (HUC5) in the ESU (NMFS 2005b). Critical habitat for PS Chinook salmon has 61 freshwater and 19 marine areas. To determine the conservation value of each watershed to ESU viability, the CHART evaluated the quantity and quality of habitat features (for example, spawning gravels, wood and water condition, side channels), the relationship of the area compared to other areas within the ESU, and the significance to the ESU of the population occupying that area. Thus, even a location that has poor quality of habitat could be ranked at high conservation value if that location was essential due to factors such as limited availability

(e.g., one of a very few spawning areas), the unique contribution of the population it served (e.g., a population at the extreme end of geographic distribution), or other important role (e.g., obligate area for migration to upstream spawning areas).

Of the freshwater watersheds, 41 are rated high conservation value, 12 low conservation value, and 8 received a medium rating. The upper Puyallup Watershed received a high conservation value rating. Freshwater PCEs in many streams and rivers throughout designated CH have been degraded by anthropogenic changes, including channel simplification, removal of riparian vegetation, stormwater and other sources of pollutants, in many cases these conditions combine to the effect of limiting productivity of salmonids critical habitat throughout the designated area is affected by climate change, as described above.

Environmental Baseline

The environmental baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

Puyallup River

The Puyallup River watershed has been substantially altered, especially throughout its lower reaches. Primary influencing factors in this area include extensive urban growth, heavy industry, dredging, agriculture, and miles of revetments and levees. An extensive infrastructure that includes both roads and railroads has further impacted these lower reaches.

The limited riparian habitat along the lower Puyallup River lacks a coniferous component and what remains has become fragmented. Less than 5 percent can be considered high quality habitat and no late-seral forest remains (Kerwin 1999). The lower Puyallup River has been dredged and channelized, and levees, dikes, and revetments dominate both banks from Commencement Bay far upstream to RM 28.6 (Kerwin 1999). Flood reduction efforts, combined with the lack of LWD in the action area, result in the relative absence of off channel habitat, refugia, and channel habitat complexity. This has also resulted in a substantial reduction in a hydrologic linkage between adjacent off-channel areas, wetlands, riparian vegetation, and succession. The habitat conditions essentially limit use by Chinook salmon and steelhead to migration through the action area, with limited rearing opportunity. Substrate fines are listed as a limiting factor for the lower Puyallup River (Kerwin 1999). Puyallup Tribal Fisheries (2005) conducted studies on the Lower Puyallup River from RM 10.7 to Commencement Bay. Few areas of gravel suitable for spawning were found and when present they were often compacted and provided little spawning opportunity.

Environmental Conditions in the Action Area

The Puyallup River, within the action area, flows through private land consisting of a few rural home sites, second and third growth forests, and grassy fields. The right bank is armored with riprap throughout the project area and immediately underneath the existing SR 162 bridge, the

south pier is protected with large concrete rubble from the original bridge piers. Stream habitat within the project area consists of glide habitat with minimal deep pool habitat along the right bank. Water within the stream is often milky during spring runoff due to glacial melt and the sediment contains a moderate amount of fines (estimated less than 12 percent). Large gravel and small cobble dominate the substrate. Less than 10 percent of the stream banks within the action area appear to be actively eroding. Wood in the channel is lacking and there is minimal potential recruitment within the riparian corridor. Minimal shade providing vegetation, large woody debris (LWD), or LWD recruitment is provided by the riparian corridor within, up and downstream of the project area. There are no fish passage barriers within the action area. Rearing habitat is very limited in the project action area as habitat complexity such as overhanging vegetation, side channels, and LWD are virtually absent.

Status of Puget Sound Chinook Salmon and Steelhead in the Action Area

Puyallup River Chinook Salmon. Ecosystem Diagnosis and Treatment (EDT) modeling results estimate that the Puyallup River supported 42,000 Chinook historically; the estimate of current abundance is 1,300. Over the last ten years, natural spawning escapement ranged from 1,500 to 5,000, with an average over the last eight years of 2,500. The median natural escapement to the South Prairie Creek spawning grounds was as low as 25 in the 1970s and 1980s (Shared Strategy 2005). The mean number of natural Chinook spawners in the Puyallup River between 1998 and 2002 was 1,679, with a range of 1,193 to 1,988 (Good et al. 2005). Late returning "fall-run" Puyallup Chinook natural spawning occurs in South Prairie Creek up to RM 15, the Puyallup mainstem up to the Electron Dam, the lower Carbon River, Voights's Creek and Kapowsin Creek. Some spawning is now believed to occur in the upper Puyallup since passage has recently been established at the Electron diversion dam (Shared Strategy 2005). Approximately 99 percent of Puyallup River fall-run Chinook are ocean type fish, with the remaining one percent being stream type fish (Beechie et al. 2006).

The naturally spawning Chinook population in the Puyallup River is comprised of an unknown mixture of natural and hatchery origin fish. The magnitude of adult hatchery fish that contribute to the natural spawning population has not been determined. There is the strong likelihood of exchange between natural and hatchery stocks (Kerwin 1999). Between 1968 and 2002, the most extreme short-term decline in natural spawner abundance in the ESU has occurred in the Puyallup River, with a lambda of 0.96. A population with a growth rate of less than 1.0 is indicative of low, non-viable natural reproduction and survival (McClure et al. 2003). However, the long-term population growth rate was positive (a lambda of 1.02). The population is likely to have a moderate to high fraction of naturally spawning hatchery fish, so it is not possible to say what the trend in naturally spawning, natural-origin Chinook salmon might be. It is therefore not possible to estimate the contribution of the naturally spawning population to spatial structure in the ESU (Good et al. 2005).

The Puyallup River population is one of five populations of fall-run Chinook in the Central and South Puget Sound basin (i.e. Sammamish, Cedar, Green and Duwamish, Puyallup, and Nisqually). As it is not one of the populations that have been identified as needing to achieve low risk status in the Puget Sound Salmon Recovery Plan (PSSRP), it needs to at least improve from current conditions to meet the ESU recovery criteria. For this reason it is important to protect this population from further decline and preserve options for its recovery (NMFS 2005c). The Puget

Sound TRT planning range for abundance is 17,000 to 33,000 (productivity of 1.0). The planning target for abundance is 5,300 (productivity of 2.3) to 18,000 (productivity of 1.5). The EDT analysis estimates that the Puyallup basin can potentially support abundance at 6,170 spawners after implementing a series of actions (Shared Strategy 2005). However, measurable recovery goals are under study by the co-managers and will be developed as Habitat, Hatchery, Hydroelectric, and Harvest (H) - Integration is achieved. The current escapement goal (number of fish allowed to "escape" harvest to spawn) for the Puyallup River Chinook is 1,200.

Puyallup River Steelhead. The winter steelhead stocks in the Puyallup basin have been declining since 1990. The precipitous decline within just the past three years has created serious concern among fisheries managers. Factor(s) responsible for the decline in steelhead escapement are unknown, especially when other salmon species are experiencing relatively good success. Escapement numbers for the USACE trap in Buckley during 2005 (152 adults) was the lowest ever recorded since 1941. South Prairie Creek averaged 150 redds annually (range 93-196) from 1999 to 2004; however, only 32 redds were observed in 2005. Fortunately, escapement increased in 2006 and 2007 (129 redds in 2006 & 168 in 2007). Decreased numbers of redds have been observed in several other drainages as well; yet a few, such as Boise Creek on the White River, have experienced relatively strong returns in spite of the basin wide declines. The smolt trapping program operated by the Puyallup Tribe's Fisheries department on the Puyallup River has observed a substantial decrease in the number of steelhead smolts captured from 2003 to 2005 (average 62.6 [range 39-77] from 2003-2005 vs. average of 315 [range 156-539] from 2000-2002) (Marks et al. 2008). The previous numbers don't include the steelhead escapement for the White River due to the traps location approximately 0.2 miles above the White/Puyallup confluence.

During the spring of 2006, in response to the declining number of winter steelhead, the Puyallup and Muckleshoot Tribes, as well as the WDFW, began a supplementation pilot project developed for the White River. The primary goal of this project is to restore the run to a strong self sustaining population. The pilot project will utilize captured wild brood stock from the USACE trap in Buckley to generate approximately 35,000+ yearling smolts. The success or failure of this project will likely determine if an additional supplementation program will be implemented on the Puyallup River.

In 2000, the PTF started the Puyallup River Smolt Production Assessment. Since 2000, a 5ft diameter rotary screw trap located on the lower Puyallup at RM 10.6, approximately seven miles downstream of the project action area, has been used to estimate juvenile production. Twenty-five unmarked steelhead were caught in the smolt trap in 2007. No production estimates were completed for steelhead migrants (Marks et al. 2008).

Habitat in the project action area is primarily used by steelhead for migration purposes. Although the Salmon and Steelhead Stock Inventory illustrates that the project area is within the spawning and rearing distribution for the Puyallup River steelhead (Marks et al. 2008).

Critical Habitat in the Action Area

Designated CH within the action area consists of freshwater migration (PCE 2), rearing (PCE 3) and spawning (PCE 1) habitat and their essential physical and biological features in the Puyallup River. The effects of the proposed action on these features are summarized as a subset of the habitat-related effects of the action discussed above, except temporary in-water effects which is discussed in the applicable CH sections, below.

The action area is the upper Puyallup River, fifth-field watershed (HUC 1711001404). The CHART determined that this watershed has a high conservation value for PS Chinook. The PCE's within this HUC5 support one of six populations in the South Sound region for this ESU. The fifth-field watershed contains 8.1 miles of spawning/rearing PCEs, 11.2 of rearing/migration PCEs, and 32.5 miles of migration/presence PCEs. The proposed action is likely to have temporary affects on all three PCEs that serve PS Chinook salmon.

Effects of the Action

Effects of the action are the direct and indirect effects of an action on the listed species and critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). NMFS identified no interrelated or interdependent actions during consultation. The effects of the action that are reasonably certain to occur are summarized below:

The proposed action includes restricting the timing of in-water work to July 15 through August 31, to reduce the number of fish exposed to the construction effects.

Effects on Puyallup River Chinook Salmon and Steelhead

Worksite Isolation and Fish Handling. During demolition of the existing bridge, the WSDOT intends to isolate the worksite from mainstem flow of the Puyallup River and remove fish from the isolated area to minimize the exposure of listed fish to construction activities. The contractor will isolate approximately 1000 sf of the Puyallup River by diverting the river to a temporary channel to allow for demolition outside of flowing water. The work area will be isolated by an aquabarrier. In the unlikely event that fish are captured within the exclusion area during construction, they will be relocated either upstream or downstream of the diversion. It is expected that fish will be able to migrate upstream and downstream using the temporary diversion channel. Injury or death of individual juvenile or adult listed fish during work area isolation are likely only if electrofishing is required, or if water clarity limits the biologist's ability to determine fish presence within the area to be dewatered, and some fish become trapped and stranded in the dewatered area. Electrofishing could kill juvenile PS Chinook and steelhead, or cause physical injuries including internal hemorrhaging, spinal misalignment, or fractured vertebrae. Between 95 percent and 98 percent, or more, of fish captured and handled, or electrofished are expected to survive with no long-term effects; two to five percent are expected to be injured or killed, including delayed mortality (NMFS 2003).

In addition, the installation of the work area isolation aquabarrier dam will dewater and temporarily expose streambed habitat, although this effect will be temporary in nature, an impact to prey species (invertebrates) is likely to occur. The project will affect habitat conditions by streambed and riverbank alteration resulting from the installation of the temporary demolition containment structure, the installation of several large hydraulic jacks for lowering the existing bridge onto 285sf of the gravel bar, removal of 135 CY of existing concrete rubble on the right bank, and removal of several creosote pilings. Any holes or pits remaining after pile removal will be backfilled with appropriately sized river rock material. The existing bridge is also to be demolished on the existing gravelbar behind the aquabarrier dam, although protected, further disturbing the gravelbar. Drift of invertebrates from upstream is expected to rapidly recolonize the affected area once the flows are restored to the natural channel (Barton 1977, Korsu 2004, Fowler 2004), therefore, the reduced prey base will only affect PS Chinook salmon and steelhead for a few weeks while the disturbed areas stabilize.

Demolition of the existing bridge will require the removal of bridge piers. The bridge pier on the south bank includes large concrete rubble pieces that have been placed as scour protection. To minimize the effects of sedimentation and turbidity, a turbidity curtain will be installed around the perimeter of the southern pier and concrete rubble area. Currently, this rubble may provide cover and some limited pool habitat for juvenile salmonids. Removal of this rubble and the associated bridge pier with machinery will cause temporary disturbance within the diversion channel and may create a temporary fish passage barrier as a result of noise and general disturbance. Further, small numbers of juvenile PS Chinook salmon or steelhead could be using the rubble area as habitat during removal. In this case, they would be displaced and possibly crushed by concrete rubble movement.

Turbidity. Elevated turbidity levels can cause stress by impairing the salmonid's ability to locate predators, find prey, or defend territories, or by creating uncomfortable conditions for gill functioning. Increased stress can compromise the effectiveness of the immune system, thereby affecting mortality rates (USFWS, 1998). Increased stress can also affect blood physiology, thereby decreasing immunological competence, growth, and reproductive success.

Turbidity will be minimized from the use of an aquabarrier. However, some amount of minor turbidity is expected during construction, during installation and particularly during removal of the aquabarrier and re-introduction of flowing water into the worksite. Steelhead juveniles of various ages, young of the year PS Chinook, and adult PS Chinook would be the life-history stages exposed to this effect. Levels of effects realized are likely sufficient only to cause temporary behavioral responses, including delayed feeding and displacement from rearing areas within the 300-foot zone where turbidity is expected to be above background levels.

Effects on Critical Habitat

Water Quality. Water quality is an essential element of the spawning, rearing, migration, and estuarine PCEs in the action area, and will temporarily be directly affected by the proposed action. The project may affect water quality conditions by increasing turbidity and sedimentation upon dewatering and installation of the aquabarrier, to a lesser extent during construction, and upon removal of the aquabarrier. Upon removal of the aquabarrier, a turbid

plume extending up to 300 feet down from the site can be expected. The NMFS expects that turbidity levels will return to background levels in a few hours after the completion of the in-water work. The temporary water quality degradation will not impair the ability of the action area to support juvenile rearing or migration of PS Chinook salmon. Further, the project will result in a reduction in untreated stormwater runoff in the immediate action area. This will provide long-term improvements to this PCE.

Small increases in turbidity are likely throughout all phases of construction. The greatest single increase in turbidity is likely to occur immediately after reintroducing flow into previously isolated work area, when a large pulse of suspended sediment is expected to occur. Because turbidity is temporary, the water quality PCE of freshwater rearing and migration is not diminished in a manner that reduces the capacity of the action area or the HUC to support the rearing or migrating role of the action area. The PCE of spawning will also not be affected because work window timing will prevent the co-occurrence of salmon spawning or eggs in the gravel with any increases in turbidity.

Water Quantity. The proposed action will only affect water quantity within the dewatered work area. Although the thalweg of the river will be temporarily moved, the quantity of water passing through the work area will not change.

Floodplain Connectivity. The proposed action will have no affect on existing floodplain connectivity in the watershed.

Passage. Habitat free of obstruction is an essential element of freshwater migration PCE that the proposed action will directly, but temporarily, affect. The project may result in a temporary barrier to migration as a result of general disturbance during removal of concrete rubble. The project will not result in any physical, chemical, or biological barrier. Disturbance that might dissuade fish from passing through the work area is expected to last less than one day, thus it is not anticipated that this temporary impact to the passage PCE will have any significant effects on the conservation value at the fifth-field watershed scale.

Forage. The proposed action will have a short-term negative effect on benthic macroinvertebrate prey by crushing or displacing them during construction. However, the affected area will cover a small fraction of the action area and it is anticipated that disturbed areas will be re-colonized within six months after project completion (Fowler 2004, Korsu 2004). This short-term negative effect will affect juvenile steelhead and Chinook salmon to only a minor extent, thus it is not anticipated to change the forage PCE of the action area in a manner that diminishes conservation of critical habitat at the fifth-field watershed scale.

Natural Cover. Natural cover is very limited in the existing pre-project work area. The project includes riparian vegetation planting which will eventually restore riparian functions. The NMFS does not expect the loss of existing riparian vegetation to appreciably reduce the suitability of the action area as rearing habitat during the several year period while the replanted vegetation establishes and matures because the initial disturbance is significantly small in comparison to the adjacent corridor and HUC5 watershed.

Substrate. Substrate is a component of the freshwater spawning PCE. There are potential spawning gravels located within the action area, including the immediate area. Because of work area isolation, turbidity caused during construction is expected to be short in duration upon removal of the aqua barrier. Although a minor amount of sediment is expected to settle out in areas that may be suitable for spawning, the volume of sediment expected will have short-term and negligible impacts on existing spawning conditions. The 1000- square foot dewatered area may also contain some substrate suitable for spawning. Because this effect is temporary and will not take place during spawning season, effects are also negligible.

Relevance of Effects on Primary Constituent Elements to Critical Habitat Conservation Value. As described above, the proposed action will have short-term negative effects on water quality (which dissipates quickly), forage (which re-establishes over weeks to months), natural cover which recovers over a period of a few years, passage (which will be very temporary), and effects to substrate, which will also be temporary. The most discernible functional change in the PCEs is the constrained dewatered area, where fish will be excluded, and benthic forage will be diminished. Because the in-water work portion of this project has a small footprint (1,000 square feet) when these changes are added to the baseline condition, the function of PCEs are modified at a level that is not appreciable within the watershed. Since these effects are not noticeable beyond the site scale, they will not appreciably diminish the conservation role of the watershed in which the site is located.

Cumulative Effects

'Cumulative effects' are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). The population of Pierce County is projected to increase by 61 percent between 2005 and 2030 from 755,900 to 1,213,326 people (http://www.ofm.wa.gov/pop/gma/projections07.asp). The NMFS assumes that future private and state actions will continue within the watershed, increasing as population density rises. Most of the watershed upstream of the action area is public land (i.e. National Park Service), so relatively few cumulative effects are expected. However, land in the action area and some of the surrounding watershed is privately owned by a variety of entities. Future upland and riparian development in the area will potentially create additional impacts such as stormwater delivery, and further demands to control the river channel to prevent flooding or damage from bank erosion.

Conclusion

After reviewing the best available scientific and commercial information regarding the status of the affected ESA-listed species, the environmental baseline, the effects of the proposed action, and cumulative effects, NMFS concludes that the proposed action will not alter the viability of the populations of affected PS Chinook salmon or PS steelhead. As such, the effects of the action, when considered with these other factors, will not appreciably reduce the likelihood of survival and recovery of the PS Chinook salmon ESU or the PS steelhead DPS. Therefore, the proposed action is not likely to jeopardize the continued existence of PS Chinook salmon or PS steelhead. This conclusion is based on the determination that the direct and indirect effects associated with the proposed action, are not expected to diminish the potential for survival or

recovery of any component population, including Chinook salmon populations and PS steelhead populations. On this basis, while take of individuals of each species may occur, the aggregate level of take will not be significant at the component population or the ESU/DPS level.

The NMFS also reviewed the status of critical habitat, the environmental baseline, the effects of the action, and cumulative effects and concluded that the proposed action will not diminish the conservation value of CH designated for PS Chinook salmon. The effects of the action bear on individual PCEs of CH in the action area by temporarily diminishing their function in the action area. However, periods of decreased function are unlikely to diminish the conservation role the action area plays in the watershed as the action area is primarily a migration corridor through which PS Chinook salmon and PS steelhead transit quickly. Furthermore, temporary effects such as those from increased turbidity and a temporary diversion within the Puyallup River will not persist long enough to impair the migratory capacity of the area. As such, the effects of the action are not likely to appreciably diminish the conservation role or value of the watershed in which the action area lies. Therefore, the proposed action will not adversely modify or destroy critical habitat.

ENDANGERED SPECIES ACT—INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the ESA prohibits the taking of endangered species without a specific permit or exemption. Protective regulations adopted pursuant to Section 4(d) extend the prohibition to threatened species. Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition. Harm in the definition of "take" includes significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering (50 CFR 222.102).

Amount or Extent of Take

The proposed action will cause capture of individual PS steelhead and Chinook salmon. The proposed action will also cause increased turbidity to which some fish will be exposed and change their normal behavior. Therefore, incidental take of listed fish is reasonably certain to occur.

The number of fish that will be exposed to capture can be predicted based on assumptions about the density of fish in the action area at the time the applicant completes fish capturing techniques and other in-water work. Data from a rotary screw trap in the lower Puyallup River indicates that about 99.7 percent of wild outmigrant fall PS Chinook salmon are headed to the estuary as subyearlings as early as late February. However, a few juveniles were also captured migrating during late August (Marks et. al 2009). Therefore, although the majority of juvenile PS Chinook salmon juveniles have migrated through the action area, a few may be passing through or rearing during the July 15 to August 31 work window. Juvenile steelhead are known to rear in freshwater for two to three years following emergence. Spawner surveys and smolt counts indicated very limited steelhead spawning in the mainstem Puyallup and tributaries near the action area. The majority of steelhead spawning takes place in the Carbon River and

downstream tributaries of the Puyallup. Therefore, similar to PS fall Chinook juveniles, it is expected that very few PS steelhead would be in the action area during in-water work. To assign numbers for potential take, the NMFS estimated densities of PS steelhead and PS Chinook salmon in the action area during in-stream work. For this consultation, the NMFS considered data from available sources, including the Electron Fish Bypass facility upstream of the action area at RM 41, and estimates from spawning survey data in the mainstem upper Puyallup and tributaries.

Since 2000, the capture of wild, unmarked PS Chinook at the Electron facility has averaged approximately 1364 fish. This number is combined with natural production estimates from the mainstem Puyallup River and tributaries such as Kapowisin Creek. Spawner surveys identified 21 redds in 2008. In Puget Sound streams, Chinook salmon redds average about 4500 eggs. An average of about 30 percent of those eggs will survive to emergence (Groot and Margolis, 1991). Based on 30 percent survival from 21 redds of approximately 4500 eggs each, NMFS estimates approximately 29,714 (28,350 +1364) newly emerged juveniles originate from the Upper Puyallup and tributaries. Of these emergent fish, approximately 90 percent move downstream prior to the in-water work window for this project (Marks et al 2009). This would leave an estimated 2972 juvenile Chinook rearing or passing through the 23-mile stretch between the Electron trap and the project area during in-water work.

Taking an average river width of about 85-feet, the NMFS estimates approximately 0.0003 PS Chinook per square foot within this reach. This number is then multiplied by the in-water work area of approximately 1500 sf (1000sf dewatered area and 500 sf for rubble removal), yielding an estimated PS Chinook density of 0.45 fish within the work area. However, NMFS assumes that juveniles in the action area would use preferred habitat types such as undercut banks, LWD, boulders, and pools. According to the BE, the concrete rubble under the existing bridge represents the only pool/boulder habitat area in the work site. Further, even though the calculation describes .45 fish in the work area, it is reasonable to assume, given the lack of complexity and habitat up and downstream of the work area, that more fish would be clustered in usable habitat as opposed to spread sparsely throughout the reach. Therefore, the NMFS assumes up to three juvenile PS Chinook may be rearing in the concrete rubble area, and may be subject to direct take, while another 1 PS Chinook may be subject to capture and/or relocation.

Approximately 27 PS steelhead redds were identified above the action area in 2009 (Marks et al. 2009). Female PS steelhead will deposit an average of roughly 6,000 eggs, based on the size of the adult. Based on 30 percent survival to emergence, NMFS estimates approximately 48,600 juveniles could be rearing in the reach. This equates to approximately.005 PS steelhead per sf. Multiplied by the 1,500 sf work area, NMFS estimates approximately7 juvenile PS steelhead could be rearing in the work area during construction. Similarly, NMFS assumes the lack of habitat in the area will result in clustering of juvenile steelhead around the concrete rubble area. As such, the NMFS estimates that 7 juvenile PS steelhead will be injured or crushed as a result of the rubble removal activities, while another 5 may be captured or relocated.

In contrast to capture as a form of take, take in the form of harm is difficult or impossible to predict in terms of the number of affected fish. For this consultation, the number of fish harmed by increased turbidity from suspended sediment could not be accurately quantified as a number

of fish. Minor pulses of increased sediment will occur during installation of the aquabarrier, during in water work, and once when the aquabarrier is removed from below the OHWL. It is impossible for NMFS to predict whether fish exposed to pulses of increased sediment will remain in the action area and be exposed to additional pulses, such that their exposure would lead to injury or death. Some exposed fish are very likely to move out of the action area due to the in-water work, or avoidance of the turbid conditions, or natural migration patterns. Furthermore, additional fish could move into the action area between pulses.

In circumstances where the number of fish that will be taken cannot be predicted, NMFS estimates the extent of anticipated take from harm based on a description of the extent of habitat modified by the proposed action. NMFS then describes the extent of take from elevated turbidity as a total length of turbidity plumes within the Puyallup River as a description of the extent of habitat modified by pulses of elevated turbidity.

Extent of Harm Caused by Water Quality Degradation. Take caused by degradation of surface water quality during in-water construction activities, is expected intermittently up to a distance of 300 feet within the Puyallup River, during one work window.

Injury or Death Caused by In-Water Work. Take from rubble removal activities will occur among up to three PS Chinook salmon and seven PS juvenile steelhead.

Injury or Death Caused by Fish Capture. Take from fish capture and electroshocking will occur among up to five juvenile PS steelhead and one juvenile PS Chinook salmon.

Take is exempted for:

1. Five juvenile PS steelhead and one PS Chinook salmon juveniles that will be captured during the fish removal and in-water work.
2. Seven juvenile PS steelhead and three PS Chinook salmon juveniles that will be crushed or injured during pier rubble removal and associated disturbance.
3. The fish harmed by the temporary degradation of 300 feet of the Puyallup River from pulses of elevated suspended sediment during installation of the aquabarrier, subsequent work below the OHWL is accomplished, and the aquabarrier is removed, all between July 15 and August 31.

The pulses of elevated suspended sediment will harm fish by impairing the feeding and sheltering success of PS Chinook salmon and PS steelhead through displacement from their preferred habitat, and through increased physiological stress. The estimated extent of habitat affected by elevated sediment levels represents the extent of take from the temporary water quality degradation of Puyallup River. This extent is readily observable and therefore suffices to trigger reinitiation of consultation, if exceeded and necessary (see H.R. Rep. No 97-567, 97th Cong., 2d Sess. 27 (1982).

Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The COE has the

continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the COE fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. The following reasonable and prudent measures are necessary and appropriate to minimize the take of listed species.

The COE shall:

1. Minimize incidental take from fish capture; and

2. Minimize incidental take from removal of in-water concrete rubble; and

3. Minimize take of PS Chinook salmon and PS steelhead from elevated turbidity.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE and its cooperators must comply with the following terms and conditions that implement the reasonable and prudent measures described above. Partial compliance with these terms and conditions may invalidate this take exemption, result in more take than anticipated, and lead NMFS to a different conclusion regarding whether the proposed action will result in jeopardy.

1. To implement RPM No. 1, the COE shall:

   a. Conduct all in-water work between July 1 and August 15;

   b. Follow the WSDOT Fish Exclusion Protocols and Standards (WSDOT 2009);

   c. Document all PS Chinook salmon and PS steelhead encountered during work area isolation by submitting an In-water Construction Monitoring Report (Appendix I) or equivalent to NMFS within 30 days of work area isolation.

2. To implement RPM No. 2, the COE shall:

   a. Operate clamshell or other machinery in a slow fashion allow fish to escape from being crushed during concrete rubble removal.

   b. Accomplish concrete rubble removal in less than one day.

3. To implement RPM No. 3, the COE shall:

   a. Monitor erosion control activities, including minimization measures and BMPs, and take corrective action if necessary to ensure protection of riparian areas and waterways. The USACE shall submit reports on the contractor's compliance with and the effectiveness of

the erosion control BMPs, minimization measures, to NMFS within 60 days of project completion.

b. Monitor turbidity levels to ensure that the project complies with Washington State water quality standards. If the project exceeds the water quality standards, the project will have exceeded the amount of take authorized, and COE must reinitiated consultation with NMFS. The COE shall report the results of the turbidity monitoring to NMFS within 60 days of project completion.

NOTICE: If a sick, injured or dead specimen of a threatened or endangered species is found in the action area, the finder must notify NMFS Law Enforcement at (206) 526-6133 or (800) 853-1964, through the contact person identified in the transmittal letter for this Opinion, or through the NMFS Washington State Habitat Office. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder should carry out instructions provided by Law Enforcement to ensure evidence intrinsic to the specimen is not disturbed unnecessarily.

All reports shall be sent to National Marine Fisheries Service, Washington State Habitat Office, Attention: Scott E. Anderson, 510 Desmond Drive SE, Suite 103, Lacey, Washington 98503.

NOTICE: To follow inactive projects and, if necessary, withdraw the opinion for an incomplete project, the COE shall provide an annual report even if no actual work was completed in a particular year.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. The following recommendations are discretionary measures that are consistent with this obligation and therefore should be carried out by the COE:

- Encourage the WSDOT to continue investigate construction methods and low-impact measures to reduce effects to ESA species.

Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by NMFS where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or designated critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat is designated that may be affected by the identified action (50 CFR 402.16).

To reinitiate consultation, contact the Washington State Habitat Office of NMFS, and refer to the NMFS Number assigned to this consultation.

Please notify NMFS if the COE carries out any of these recommendations so that we will be kept informed of actions that are intended to improve the conservation of listed species or their designated critical habitats.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirement of section 305(b), Magnuson Stevens Act (MSA) directs Federal agencies to consult with NMFS on all actions, or proposed actions, which will adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH. The Pacific Fishery Management Council designated EFH for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Chinook salmon, coho salmon, and pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook, coho, and pink salmon (PFMC 1999).

The protective elements of the proposed action along with ESA terms and conditions provided in the incidental take statement above are sufficient to minimize and avoid effects on designated EFH in the action area. Therefore, NMFS makes conservation recommendations pursuant to MSA (section 305(b)(4)(A)). Since NMFS is not providing conservation recommendations at this time, no 30-day response from COE is required (MSA section 305(b)(4)(B)).

This concludes consultation under the MSA. If the proposed action is modified in a manner that may adversely affect EFH, COE will need to reinitiate consultation in accordance with the implementing regulations for EFH at 50 CFR 600.920(l).

Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations (50 CFR 600.920(j) (1)). The response must include a description of measures proposed to avoid, mitigate, or offset the adverse affects of the activity on EFH. If the response is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

Supplemental Consultation

The COE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations [50 CFR 600.920(k)].

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section addresses these Data Quality Act (DQA) components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: Utility principally refers to ensuring that the information contained in this document is helpful, serviceable, and beneficial to the intended users. Those users include the COE, Pierce County, and Puyallup Tribe of Indians. Individual copies were provided to the above-listed entities. This consultation will be posted on the NMFS Northwest Region website (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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